DE-0363
NEW CASTLE PUBLIC WELLS GROUNDWATER PLUME (AKA ZERO (0) E. BASIN ROAD NEW CASTLE PFOS-PFOA) SITE INSPECTION WORK PLAN

New Castle, Delaware

Prepared For
USEPA Region 3
1650 Arch Street
Philadelphia, PA 19109-2029

Prepared By
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May 2017

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1.0 INTRODUCTION

The Delaware Department of Natural Resources and Environmental Control - Site Investigation and Restoration Section (DNREC-SIRS), under a cooperative agreement with the United States Environmental Protection Agency (EPA), has developed this Site Inspection (SI) work plan for the New Castle Public Wells Groundwater Plume Site ("Site"), also known as the Zero (0) E. Basin Road New Castle PFOS-PFOA Site, located in New Castle, New Castle County, Delaware (Figure 1).

2.0 PURPOSE

The SI is intended to determine whether hazardous substances, particularly poly- and perfluoroalkyl substances (PFASs), are present and are migrating to the environment, especially to the public wells in New Castle, by collecting and evaluating environmental samples. The SI is not intended to be a detailed extent-of-contamination assessment or risk assessment. The purpose of this SI work plan is to document the sampling and analysis plan for the Site and to describe the sampling procedures.

Based on the conclusions drawn in the SI report, EPA and DNREC will decide whether the Site should undergo further investigation or obtain a "No Further Action" (NFA) designation under the Federal Superfund and/or State Site Investigation & Restoration Section Programs.

3.0 SITE DESCRIPTION

The New Castle Public Wells Groundwater Plume Site, also known as the Zero (0) E. Basin Road New Castle PFOS-PFOA Site, is an approximately seven square mile area surrounding contaminated public wells located in New Castle, New Castle County, Delaware (Figure 2). The Site includes sixteen areas of potential concern (AOPCs) identified during a Preliminary Assessment (PA) by DNREC-SIRS in March 2015. The purpose of the PA was to identify potential sources of perfluorinated compunds (PFCs), including perfluorooctanoic acid (PFOA) and perfluorooctanoic sulfonate (PFOS), which were detected in five New Castle public drinking water supply wells. PFCs have more recently been referred to as poly- and perfluoroalkyl substances (PFASs). The five wells impacted by PFASs included Artesian Water Company's Wilmington Manor Well #3 and Jefferson Farm Well #1 and the City of New Castle's Basin Road Well, Schoolhouse Lane Well, and Frenchtown Road Well (Figure 3). The wells were taken off-line or required carbon treatment due to exceedances of EPA's preliminary health advisory levels for PFOS (0.2 micrograms per liter (ug/l)) and/or PFOA (0.4 ug/l). In May 2016, EPA established a lifetime health advisory level (HAL) of 0.07 micrograms per liter (ug/l) for PFOS, PFOA, or combined PFOS/PFOA. At present, additional Artesian and City of New Castle wells in this area exceed the HAL for PFOS, PFOA, and/or combined PFOS/PFOA.

The Site is approximately bound by I-295 to the north, the Delaware River to the east, Route 273/ Frenchtown Road to the south, and Route 13/DuPont Highway and New Castle County Airport to the west. The impacted public drinking water supply wells are located in residential and commercial areas. The western half of the Site includes the New Castle County Airport (NCCA), retail and commercial centers along Route 13, large tracks of open land, and several industrial parks. The eastern half of the Site is primarily housing developments intermixed with strip malls and industrial parks and a rails-to-trails pathway.

The sixteen areas of potential concern (Figure 4) were identified in the March 2015 Preliminary Assessment. Starting at the southern extent of the Site on Frenchtown Rd and moving counter clockwise the AOPCs are:

Area 1: Quigley Blvd Industrial Park (32parcels)
Area 2: Harry Wood LF (DNREC-SIRS Site)
Area 3: Centerpoint Industrial Park (23parcels)
Area 4: Boulden Interchange Park (12 parcels - Boulden Blvd Southside),
Area 5: Southgate Center Industrial Park (39 parcels - Boulden Blvd Northside)
Area 6: Matassino Rd (18 parcels - North and South of Boulden Blvd. west of RR)
Area 7: E. Commons Blvd Industrial Complex (17 parcels - East of W. Basin Rd)
Area 8: BMX fire training area at track off Commons Blvd on Speedway Dr.
Area 9: NCCA fire training area at the north end of runway #19
Area 10: Delaware Air National Guard (DANG) fire training area
Area 11: Rt141 Basin Rd Carpet Warehouse across from the DANG
Area 12: Rt13 Carpet Warehouse just north of Rt141 Basin Rd overpass
Area 13: Wilmington Manor Fire Company on Rt13
Area 14: NCC airport (crash sites & fire systems in hangers)
Area 15: Rt13 Commercial District
Area 16: Old Airport Road Commercial District

This initial phase of the Site Inspection for New Castle Public Wells Groundwater Plume Site will focus on potential groundwater contamination at Areas 8, 9, 11, 12, 13, and 14 (Figures 5 – 10) and potential soil contamination at Area 8. After review of the Preliminary Assessment, these areas were identified by EPA and DNREC as high priority and the focus of this initial phase of the Site Inspection due to operational history and proximity to existing exceedances of EPA's HAL for PFOS, PFOA, or combined PFOS/PFOA. The Delaware Air National Guard (DANG/Area 10) and the Harry Wood Landfill (Area 2) will not be evaluated further as part of the New Castle Public Wells Groundwater Plume Site. The DANG is currently investigating and monitoring PFAS contamination on the base facility. At the Harry Wood Landfill, groundwater has already been sampled and analyzed for PFAS from monitoring wells on-site. Both facilities will continue to be addressed as their own sites, and will not be included in this SI.

4.0 SAMPLING

DNREC-SIRS proposes to collect groundwater samples from approximately 17 monitoring wells at Areas 8, 9, 11, 12, 13, and 14 and soil samples from approximately 6 boreholes at Area 8 only. The proposed locations are shown on Figure 11. **The locations are subject to change based on field conditions.** During sampling activities, DNREC-SIRS will follow the Health and Safety Plan included in Appendix A.

DNREC will coordinate with Miss Utility and, as needed, a private utility mark-out company to clear the area around the monitor well locations.

The sample locations will be drilled by a State of Delaware licensed water well driller. All locations will be drilled to meet the requirements of the Delaware Regulations Governing the Construction and Use of

Wells, April 6, 1997.

4.1 Soils

Twelve (12) soil samples are proposed to be collected from six (6) boreholes **at Area 8 only**. A monitoring well will also be installed at three of these boreholes. DNREC proposes to sample both shallow and deep soil from each borehole. No soil samples are proposed to be collected at Areas 9, 11, 12, 13, or 14. However, if soil at these areas exhibits elevated PID readings, significant odor, or visible contamination then a soil sample will be collected and screened, at minimum, by the DNREC-SIRS screening laboratory. Figure 11, the proposed sample location map, shows the approximate soil sample locations. Actual sampling locations will depend on site conditions and utility clearances.

Soil borings will be advanced using a direct push Geoprobe®-type drilling rig and logged by a DNREC-SIRS Hydrologist. The shallow soil sample will be collected from the top 24 inches of the first sampling sleeve in each borehole. The deep soil sample will generally be collected from the two foot interval immediately above the groundwater table.

The volatile samples will be collected from the sampling sleeve using a 10mm syringe, and then the soil will be placed into a 40ml VOA vial containing 25ml of methanol. The remaining soil will be homogenized with disposable plastic scoops in a disposable food-grade aluminum pan and put into sterilized 8oz (or smaller) wide mouth glass jars for semi-volatile organic compound (SVOC), dioxin, metals, pesticide, and/or polychlorinated biphenyl (PCB) analysis. The jars will be placed in zip-lock bags and stored in coolers with ice for transportation. The boreholes will be subsequently backfilled with the remaining excavated material and topped with either bentonite chips or concrete/asphalt patch.

4.2 Groundwater

Monitoring wells (with an inner diameter of 1.5") are planned to be installed at 17 locations at depths up to 45 feet below ground surface. Prepacked well screens will be utilized. The wells will be screened in either the Columbia Aquifer or Upper Potomac Aquifer but will not penetrate the confining clay of the Upper Potomac Formation (if encountered). Groundwater samples, including QA/QC samples, are expected to be collected from the 17 newly installed monitoring wells at a minimum of 48 – 72 hours after the wells are installed and developed. The wells will be developed by the driller in accordance with DNREC regulations. Exact well locations will be approved by a DNREC-SIRS Hydrologist based on the geology, terrain and past activities at the Site and surrounding area. The monitoring wells will be surveyed in order to establish relative groundwater elevation and groundwater flow direction.

Groundwater will be collected from the wells using a disposable high density polyethylene (HDPE) bailer. Each well will be purged using a bailer of at least three well volumes and/or until certain groundwater parameters stabilize. The groundwater parameters to be monitored and recorded are temperature, pH, conductivity, dissolved oxygen, and turbidity every five minutes until the values are relatively unchanged for three consecutive intervals.

At Areas 9, 11, 12, 13, and 14:
Groundwater collection will start with the volatile sample. Three or four VOA vials (depending on the lab) preserved with hydrochloric acid (HCl) will be filled first. Due to the potential for cross-contamination, a

new disposable bailer will be used to collect the PFAS sample. The PFAS groundwater sample will be collected second in pre-cleaned 250 mL HDPE containers. All bottles will be placed in coolers with ice for transportation to the laboratory.

Since PFASs may be present in sampling equipment and other common consumer products, extra precaution must be taken to prevent introduction of these contaminants to the groundwater samples. Refer to Table 1 for a list of prohibited and acceptable items to be used during sampling of PFASs.

At Area 8 only:
Groundwater collection will start with the volatile sample. Three or four VOA vials (depending on the lab) preserved with hydrochloric acid (HCl) will be filled first. Due to the potential for cross-contamination, a new disposable bailer will be used to collect the PFAS sample. The PFAS groundwater sample will be collected second in pre-cleaned 250 mL HDPE containers.

Since PFASs may be present in sampling equipment and other common consumer products, extra precaution must be taken to prevent introduction of these contaminants to the groundwater samples. Refer to Table 1 for a list of prohibited and acceptable items to be used during sampling of PFASs.

Next, 1-liter to 2-liter unpreserved amber jars will be filled for semi-volatiles analysis and then dioxin analysis. Finally, 1-liter polyurethane containers preserved with nitric acid (HNO3) are filled for total metals and dissolved metals. The sample collected for dissolved metals analysis will be filtered by the laboratory to remove the solids that are suspended within the water column. All bottles will be place in coolers with ice for transportation to the laboratory.

4.3 Sediment and Surface Water

No sediment or surface water samples are proposed to be collected at this time.

5.0 ANALYSIS

From the environmental samples collected and screened, approximately 15-20% of the soil samples and all of the water samples collected from wells including the QA/QC samples may be submitted to the DNREC Division of Water laboratory and/or Test America, Inc. for confirmatory analysis of chemicals of potential concern.

Chemicals of potential concern for soil and/or groundwater consist of all or part of the USEPA Target Analyte List (Inorganics) and Target Compound List (Organics) (TAL/TCL) in addition to poly- and perfluoroalkyl substances (PFASs) and dioxins.

All soil samples delivered to the analytical laboratory will have been screened in the DNREC-SIRS' Laboratory for the following classes of compounds: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH) and metals. Screening will be performed in the DNREC-SIRS' Laboratory using a portable GC/MS and an X-Ray Fluorescence instrument (XRF). Partial and/or full TAL/TCL analysis may be conducted on samples based upon the results of the screening analysis. Soil samples collected from Area 8 will be analyzed for dioxins as well based on the site operational history and as recommended by EPA. Screened

samples identified as having elevated concentrations of contaminants for a particular chemical suite shall be sent to the DNREC Division of Water Laboratory for confirmatory analysis. In the event that the DNREC lab needs to out-source some of the analytical processes, the samples will be sent to Test America, Inc., a DNREC-SIRS qualified laboratory.

At the analytical lab, the Gas Chromatography/Mass Spectroscopy (GC/MS) System will be used to analyze soil for VOCs, SVOCs, dioxins, pesticides and/or PCBs. Metals will be analyzed using an Atomic Absorption Unit and an Inductively Coupled Plasma Unit (AA and ICP). These constituents are analyzed at sites with environmental and health impact concerns because they are commonly found in industrial areas. The above constituent groups, with the exception of dioxins and PFASs, comprise the TAL/TCL list. Analysis using the GC/MS system and AA and ICP provides a good cursory tool by which to determine the presence or absence of compounds and analytes at sites under investigation. Soil samples will not be analyzed for PFASs during this phase of the SI.

At the analytical lab, the GC/MS System will also be used to analyze all groundwater samples for VOCs and groundwater samples from Area 8 only for SVOCs and dioxins. AA and ICP will also be used to analyze groundwater samples from Area 8 only for total and dissolved metals.

All of the groundwater samples collected from monitoring wells, including the QA/QC samples, will be submitted to Test America-Sacramento for analysis of PFAS by USEPA Method 537 Modified. Method 537 Modified utilizes liquid chromatography/tandem mass spectrometry (LC/MS/MS) to analyze water samples for PFASs. Water samples must be extracted within 14 days of collection and analyzed within 40 days from extraction. A list of analytes, reporting limits, and method detection limits associated with this method are provided in Table 2.

Table 3 provides a summary of the analysis by matrix and area of potential concern.

6.0 QUALITY ASSURANCE / QUALITY CONTROL

Field sampling and sample handling will adhere to the procedures as specified in the State of Delaware Site Inspection Quality Assurance Project Plan (QAPP) and as described in this site-specific work plan. A copy of the Quality Assurance Project Plan is available for review at the office of the Department of Natural Resources and Environmental Control, 391 Lukens Drive, New Castle, Delaware, 19720.

Sampling equipment will be decontaminated between sampling locations using procedures outlined in the Quality Assurance Project Plan. Sterile disposable sampling equipment, such as disposable HDPE bailers and soil scoops, will be utilized where applicable.

The QA/QC sample program also requires that samples be collected to evaluate the quality of field sampling practices and equipment decontamination practices. The following samples will be collected during the sampling period:

Trip Blanks
Field Duplicates
Laboratory Duplicates

Field Rinsate Blanks

Trip Blanks consist of four-forty milliliter glass vials filled with distilled water and sealed with a Teflon lined cap. Trip blanks are used to evaluate the potential for cross contamination of site samples from contamination sources outside the sampling area. Trip blanks are filled with distilled water prior to sampling, sealed, transported to the sampling site and returned to the laboratory without reopening for analysis. Trip blanks are analyzed for volatile organic compounds (VOC) only. One trip blank will be included with each cooler containing VOC samples.

Field duplicates consist of an actual sample for which twice as much volume as necessary has been collected. Aliquots of this volume are then distributed in two sets of sample containers and submitted to the laboratory as two separate samples. Field duplicates are used to assess the consistency of sampling homogeneity and laboratory analytical consistency. One field duplicate will be collected per 20 samples or per day for each media.

Laboratory duplicates (also referred to as Matrix Spike/Matrix Spike Duplicate [MS/MSD]) represent a sample location in which twice the normal sample volume is collected. The purpose of the laboratory duplicate is to provide the analytical laboratory with a sample which can also serve to calibrate analytical machinery. The laboratory duplicate is normally spiked with a known concentration of chemical and this sample is used to calibrate the instrument. One MS/MSD will be collected per 20 samples or per day for each media.

Field Rinsate blanks consist of pouring demonstrated Analyte-free distilled water over decontaminated sampling equipment as a check that the decontamination procedure was adequately performed and that there was no cross contamination of samples. Analysis of Rinsate blanks is performed for all analytes of interest. One field rinsate blank will be collected per 20 samples or per day.

Validation of the analytical data results will be performed by DNREC's Analytical Chemist, Robert Schulte.

7.0 PROJECT SCHEDULE

DNREC has established a project schedule for the New Castle Public Wells Groundwater Plume Site. The schedule establishes a timeframe for completion of each activity, and is included below. Once the sampling, analysis, and data validation have been completed, the draft report will be prepared. Following EPA review and comment, the final report is anticipated to be available in September 2017.

Project Time Line:

Action	**Date**
Finalize Work Plan	April 2017
Monitor Well Installation	June 2017
Soil Sampling	June 2017
Groundwater Sampling	June 2017
Final Report to EPA	September 2017

TABLES

Table 1. List of Prohibited and Acceptable Items during Sampling of PFASs

Prohibited Items	Acceptable Items
Sampling Equipment containing the following materials:	
Polytetrafluoroethylene (PTFE)	Stainless steel
Teflon ®	Acetate
Low-density polyethylene (LDPE)	Silicone
	High-density polyethylene (HDPE)
	Polypropylene
Non-Sampling Field Equipment	
Waterproof field books	Non-waterproof loose-leaf paper
Plastic clipboards, binders, or spiral hard cover notebooks which may be coated	Masonite or aluminum clipboards
Sharpies ® or similar indelible markers	Ball-point pens or pencils
Post-it ® notes	
Field Clothing and Protective Gear	
New clothing and clothes treated for stain resistance	Wash clothes several times before use during sampling
Avoid using fabric softener	Wear clothes made from natural fibers such as cotton
Water-resistant clothing and shoes	Rain gear made from polyurethane or wax-coated materials
Avoid using cosmetics, shampoos, moisturizers or similar items on the morning of sampling	Sunscreen and insect repellant with 100% natural ingredients
Tyvek ®	Wear nitrile gloves at all times and change gloves often during sampling
Avoid contact with car upholstery treated with PFASs	
Sample Containers and Shipping	
Glass sample containers	Lab-supplied plastic containers, such as polypropylene or HDPE
Teflon ®-lined caps	Unlined polypropylene screw caps
Blue Ice ®	Regular Ice
Shipping tape used to secure coolers may contain PFASs. Avoid touching samples with tape.	
Decontamination	
Decon 90	Alconox ®
Food and Drink	
Do not handle pre-wrapped food, such as candy bars, granola bars, microwave popcorn, etc., in sampling area	Wash hands thoroughly after handling fast food, snacks, or other items that may contain PFASs

Table 2. Analyte List and Limits for PFAS by Method 537 Modified - Water

Analyte	CAS Number	Reporting Limit (ng/L)	Method Detection Limit (ng/L)
Perfluorobutanoic acid (PFBA)	375-22-4	2.00	0.458
Perfluoropentanoic acid (PFPeA)	2706-90-3	2.00	0.989
Perfluorohexanoic acid (PFHxA)	307-24-4	2.00	0.786
Perfluoroheptanoic acid (PFHpA)	375-85-9	2.00	0.802
Perfluorooctanoic acid (PFOA)	335-67-1	2.00	0.748
Perfluorononanoic acid (PFNA)	375-95-1	2.00	0.654
Perfluorodecanoic acid (PFDA)	335-76-2	2.00	0.440
Perfluoroundecanoic acid (PFUnA)	2058-94-8	2.00	0.748
Perfluorododecanoic acid (PFDoA)	307-55-1	2.00	0.584
Perfluorotridecanoic Acid (PFTriA)	72629-94-8	2.00	0.551
Perfluorotetradecanoic acid (PFTeA)	376-06-7	2.00	0.199
Perfluorobutanesulfonic acid (PFBS)	375-73-5	2.00	0.918
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	2.00	0.870
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	2.00	0.713
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	2.00	1.28
Perfluorodecanesulfonic acid (PFDS)	335-77-3	2.00	1.21
Perfluorooctane Sulfonamide (FOSA)	754-91-6	2.00	0.638

Table 3. Summary of Analysis by Matrix and Area of Potential Concern

	Analysis by Matrix	
Area of Potential Concern	**Soil**	**Groundwater**
Area 8	VOC,SVOC, Metals, Dioxins	VOC, PFAS, SVOC, Metals, Dioxins
Area 9	None*	VOC, PFAS
Area 11	None*	VOC, PFAS
Area 12	None*	VOC, PFAS
Area 13	None*	VOC, PFAS
Area 14	None*	VOC, PFAS

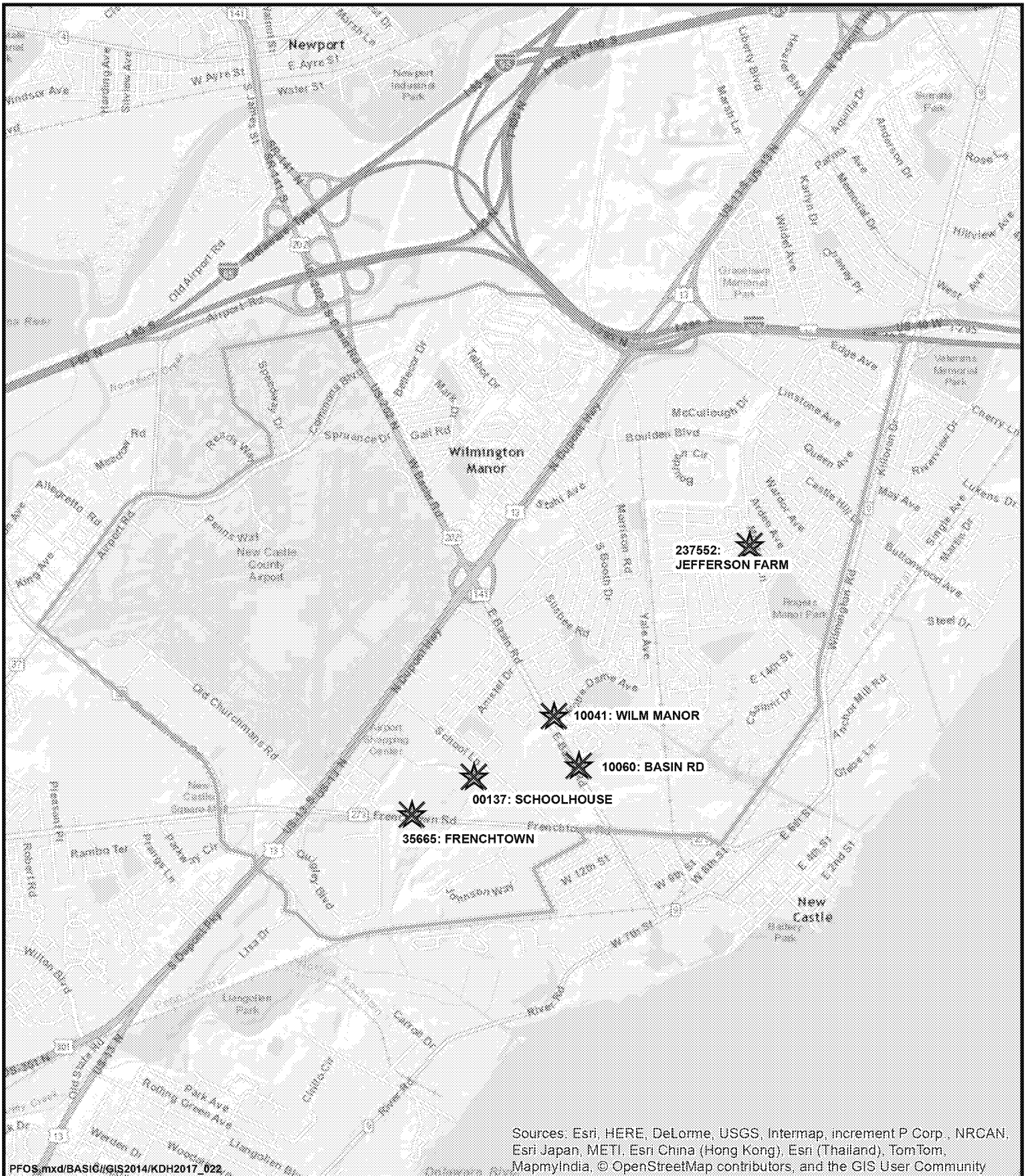
*No soil samples are proposed to be collected at Areas 9, 11, 12, 13, or 14. However, if soil at these areas exhibits elevated PID readings, significant odor, or visible contamination then a soil sample will be collected and screened, at minimum, by the DNREC-SIRS screening laboratory. Additional soil analysis will be determined based on the soil screening results.

FIGURES

FIGURE 1
SITE LOCATION
0 BASIN ROAD
NEW CASTLE
AREA OF INTEREST

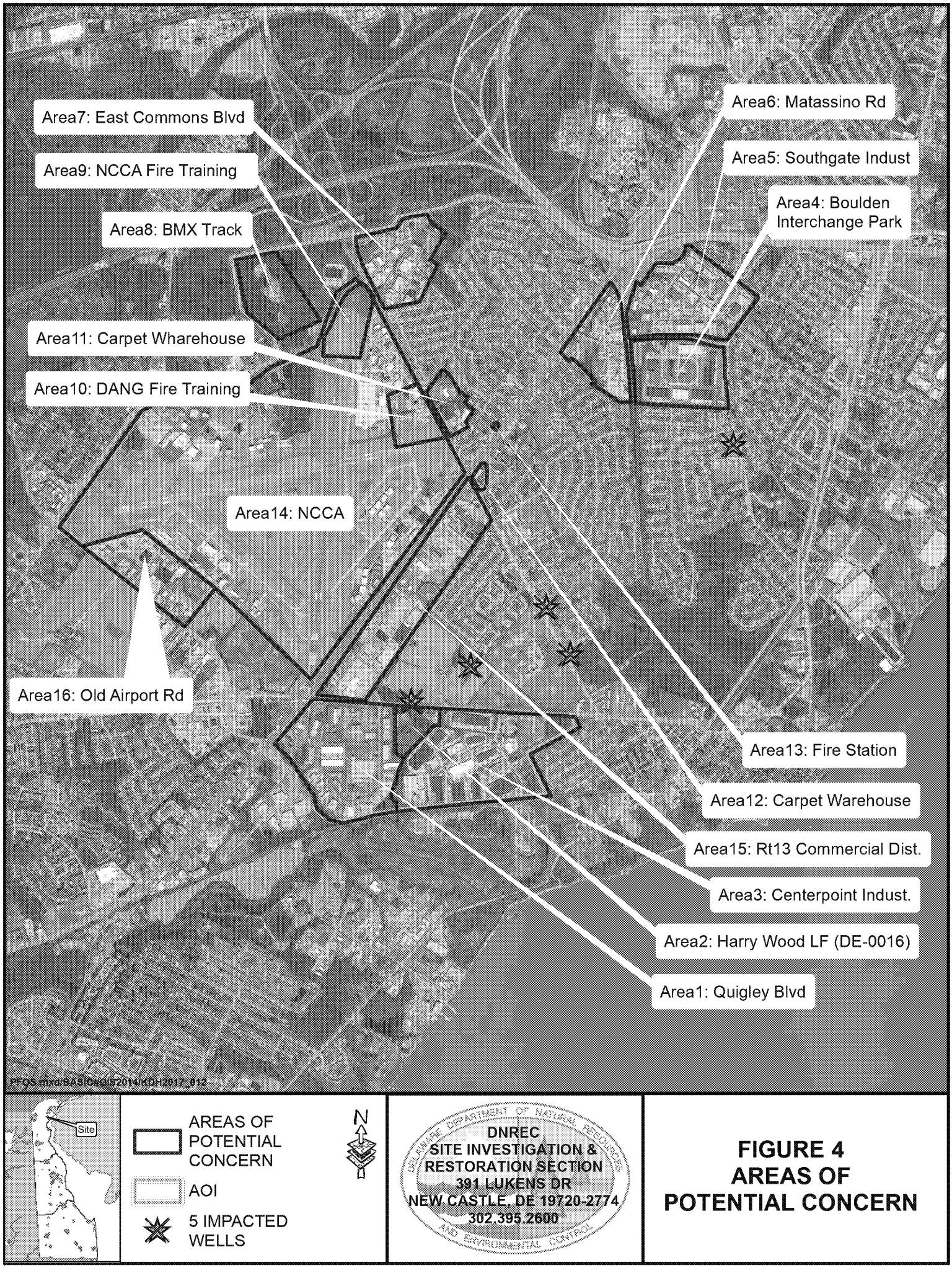
DNREC
SITE INVESTIGATION & RESTORATION SECTION
391 LUKENS DR
NEW CASTLE, DE 19720-2774
302.395.2600

FIGURE 2
AREA OF INTEREST



DNREC
SITE INVESTIGATION & RESTORATION SECTION
391 LUKENS DR
NEW CASTLE, DE 19720-2774
302.395.2600

FIGURE 3
IMPACTED PUBLIC WELLS



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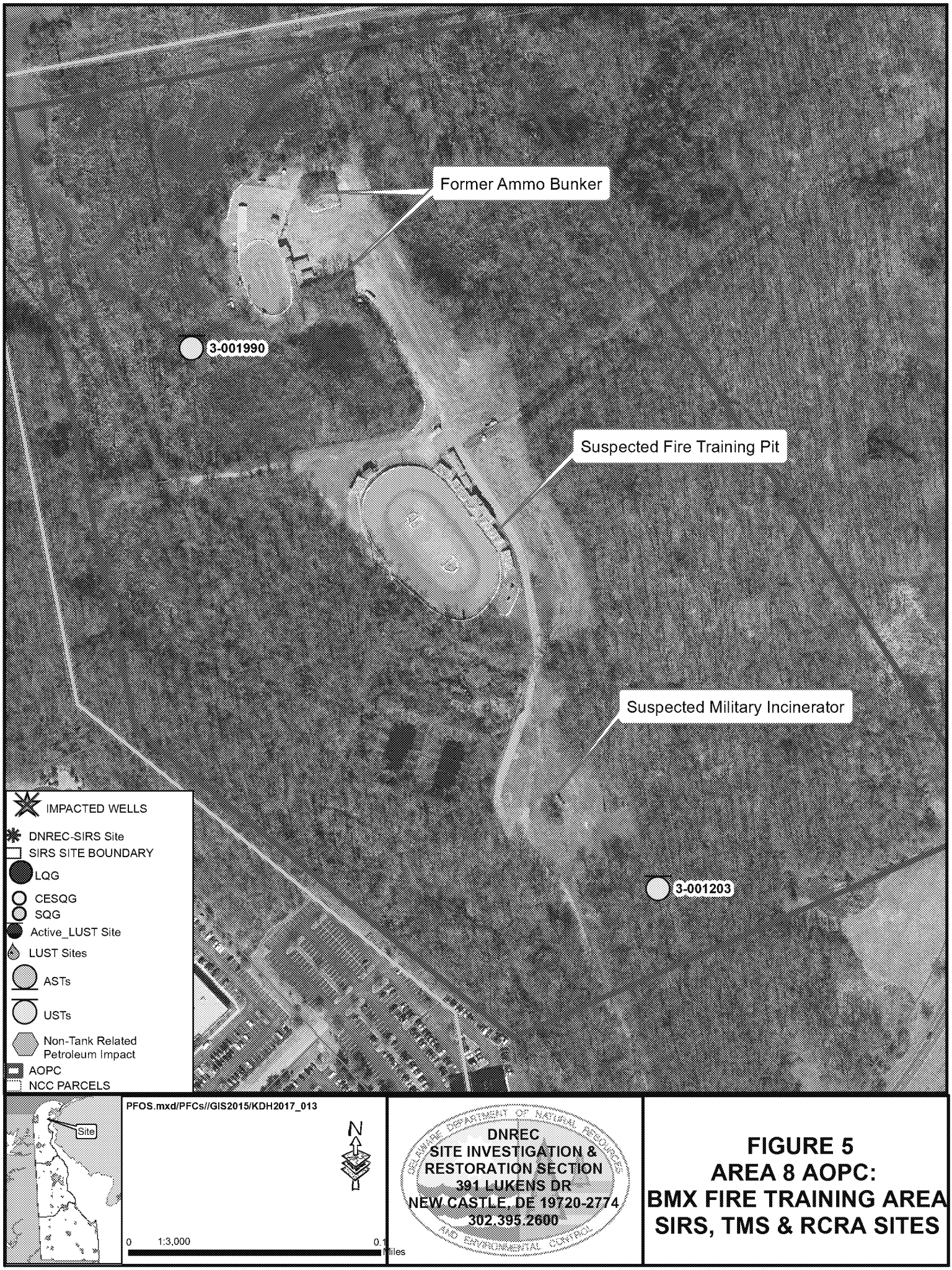
Former Ammo Bunker
3-001990
Suspected Fire Training Pit
Suspected Military Incinerator
3-001203
IMPACTED WELLS
DNREC-SIRS Site
SIRS SITE BOUNDARY
LQG
CESQG
SQG
Active_LUST Site
LUST Sites
ASTs
USTs
Non-Tank Related Petroleum Impact
AOPC
NCC PARCELS
Site
PFOS.mxd/PFCs//GIS2015/KDH2017_013
N
0
1:3,000
0.1
miles
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DNREC
SITE INVESTIGATION & RESTORATION SECTION
391 LUKENS DR
NEW CASTLE, DE 19720-2774
302.395.2600
FIGURE 5
AREA 8 AOPC:
BMX FIRE TRAINING AREA
SIRS, TMS & RCRA SITES

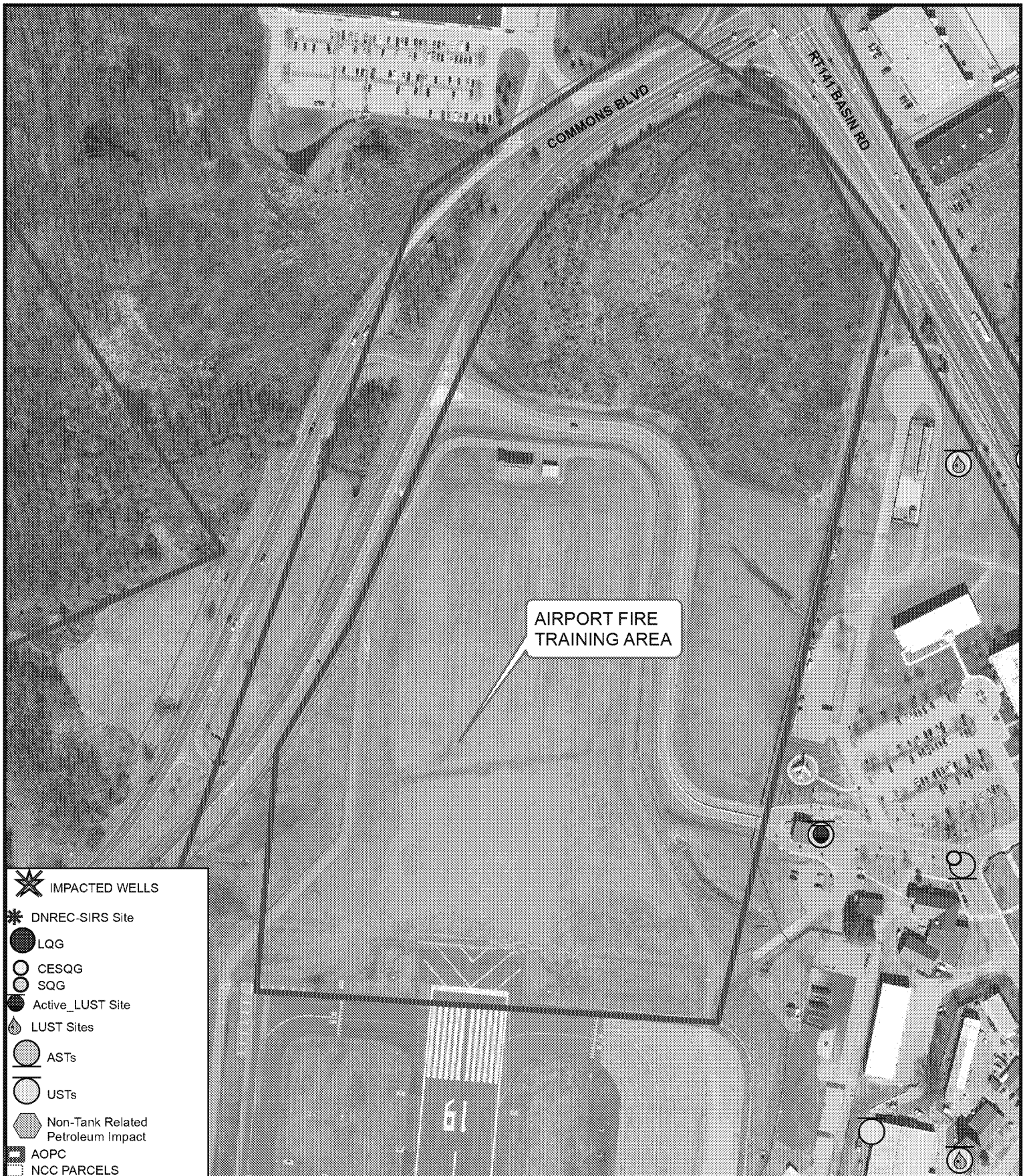

FIGURE 6
AREA 9 AOPC:
NCCA FIRE
TRAINING AREA
SIRS, TMS & RCRA SITES

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FIGURE 7
AREA 11 AOPC:
RT141 BASIN RD
CARPET WHAREHOUSE
SIRS, TMS & RCRA SITES

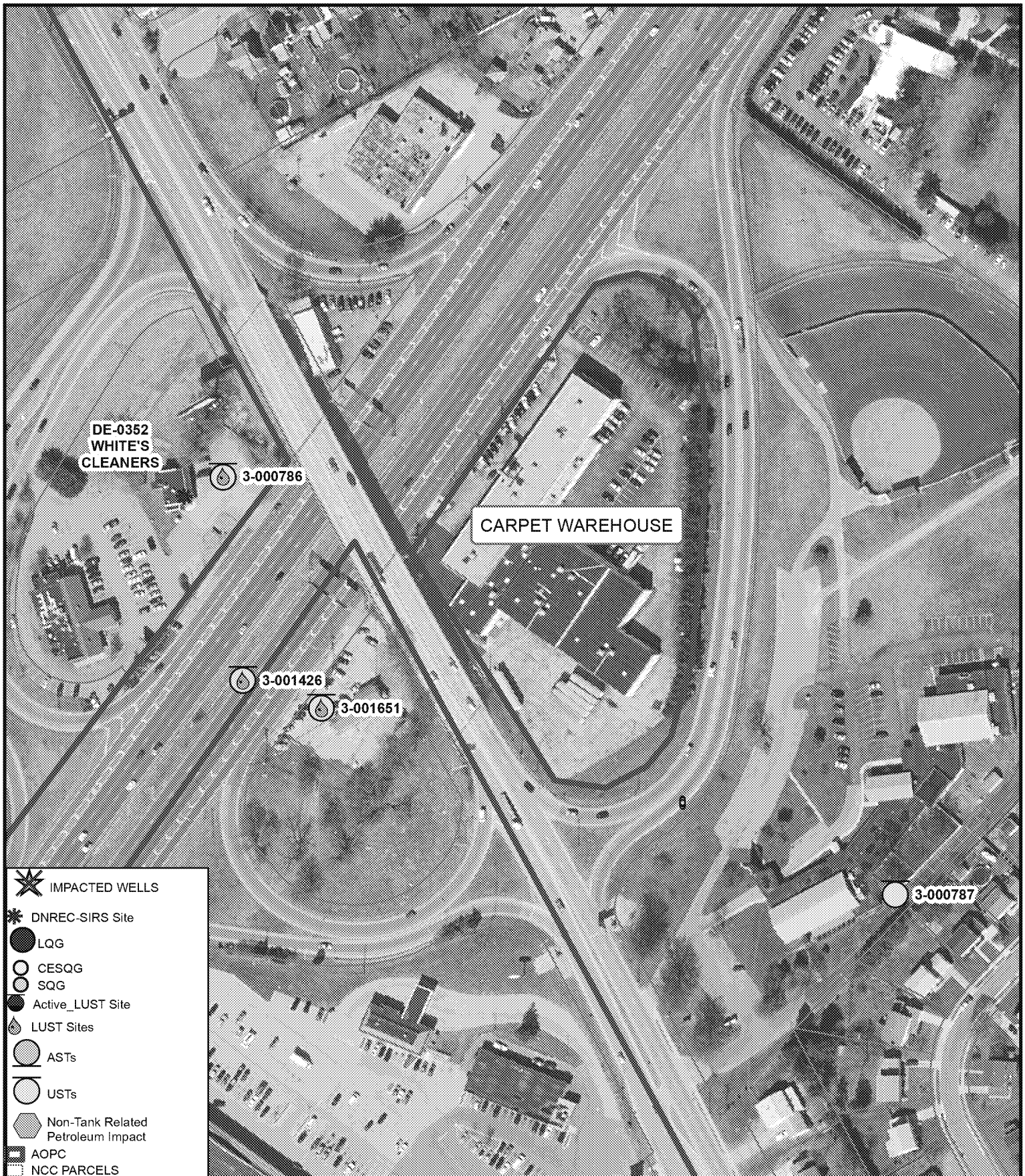

FIGURE 8
AREA 12 AOPC:
RT13 DUPONT HWY
CARPET WHAREHOUSE
SIRS, TMS & RCRA SITES

FIGURE 9
AREA 13 AOPC:
WILMINGTON MANOR FIRE COMPANY
SIRS, TMS & RCRA SITES

FIGURE 10
AREA 14 AOPC:
NEW CASTLE COUNTY AIRPORT
SIRS, TMS & RCRA SITES

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FIGURE 10A
CRASH SITES
FIRE SYSTEMS

BLD_No	OWNER	Fire Systems
(TH-1)	?	?
(TH-2)	?	?
(TH-3)	?	?
(TH-4)	?	?
(TH-5)	?	?
(TH-6)	?	?
BR-1	DUMONT	NA
BR-2	DUMONT & DRBA	NA
CC-11(604)	DUMONT	YES
CC-13	ARMY GUARD	YES
CC-15	ARMY GUARD	YES
DH-129	?	?
DH-131	AERO-WAYS	YES
DH-133	AERO-WAYS	YES
DH-135	DRBA	YES
DH-137	DRBA	YES
DH-139	DASSAULT	YES
DH-147	?	?
DH-149	?	?
DH-151	?	?
DH-153	?	?
DH-155	?	?
DH-189	?	?
DH-191	DASSAULT	NO
DH-193	DASSAULT	YES
DH-195	DASSAULT	YES
DH-197	DRBA	NO
DH-199	DUPONT	NO
DH-211	?	?
DL-01	RED EAGLE	NO
DW-01	DRBA	YES
DW-03	?	?
DW-05	DRBA	YES
DW-06	DRBA	YES
DW-09	DRBA	YES
DW-10	DRBA	YES
DW-13	DRBA	YES
DW-17	DRBA	YES
NC-100	?	?
OC-100	MAIN LINE HELO	NA
OC-110A	AERO-TAXI	YES
OC-110B	AERO-TAXI	NA
OC-110C	(AERO-TAXI) ?	?
OC-120A	ATLANTIC	NA
OC-120B	ATLANTIC	NA
OC-140	TCI/GORE	NA
OC-142	HAWKER BEECH	YES
OC-160	DRBA	NA
OC-162	PENSKE	YES
OC-176	ATLANTIC	NO
PD-2715	?	?
PD-2721	?	?
PW-01	?	?
PW-12	DRBA	NA
PW-13	CORP COMMONS	NA
PW-13.5	CORP COMMONS	NA
PW-15	CAMPBELL	NA
PW-17(601)	DRBA	YES
SP-2600	?	?
SP-2714	?	?
SR-49	?	?
SR-50	?	?

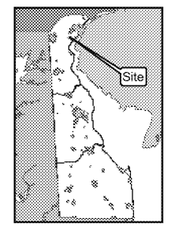
N

DH-135 NCCA_BLDS

5 IMPACTED WELLS

AOI

AREAS OF POTENTIAL CONCERN



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302.395.2600

PFOS.mxd/BASIC//GIS2015/KDH2017_019

0 1:10,000 0.5 Miles

ED_004821A_00013504-00025

FIGURE 11
NEW CASTLE
PUBLIC WELLS
GROUNDWATER PLUME
PHASE 1 SAMPLING
PROPOSED MW LOCATIONS

N

LOCATION TYPE

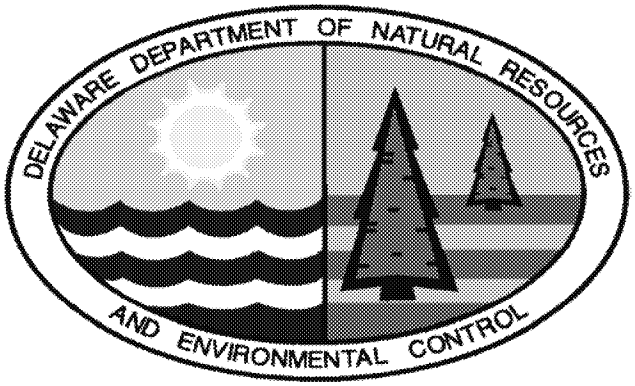
- SOIL BORING
- SHALLOW MONITOR WELL

0 0.1 0.2 Miles
1:8,500

Prj: NCCA 8x11 Sample Locs //Doc: KDHGIS2017_011

APPENDIX A

HEALTH AND SAFETY PLAN



SITE HEALTH AND SAFETY PLAN

FOR THE

NEW CASTLE PUBLIC WELLS GROUNDWATER PLUME (AKA ZERO (0) E. BASIN ROAD NEW CASTLE PFOS-PFOA) (DE-0363)

FIELD ACTIVITIES

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SITE SAFETY PLAN FOR
NEW CASTLE PUBLIC WELLS GROUNDWATER PLUME (DE-0363)
FIELD ACTIVITIES

SCHEDULED FIELD DATE: Spring/Summer 2017

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed for DNREC personnel for the field activities at the New Castle Public Wells Groundwater Plume (aka Zero (0) E. Basin Road New Castle PFOS-PFOA) Site. This HASP is not applicable to any activities not specifically addressed in this HASP. Provisions for air monitoring and air sample collection are addressed in case the need arises.

This HASP establishes guidelines and requirements for the safety of DNREC personnel and is based on a review of available data and an evaluation of potential hazards associated with the site.

DNREC has developed this HASP in accordance with all applicable federal and state standards and regulations. The key regulations which govern the proposed field operation activities as mandated by the Occupational Safety and Health Administration (OSHA) area listed below:

REGULATION	SUBJECT
29 CFR 1910.20	Employee Exposure and Medical Records
29 CFR 1910.120	Hazardous Waste Operations
29 CFR 1910.134	Respiratory Protection
29 CFR 1910.1000	Toxic and Hazardous Substances

1.1 HASP Management

Due to the varying degree and type of hazards encountered by field personnel, certain administrative policies and procedures must be implemented. These include the use of: 1) properly trained personnel; 2) specific criteria for field team organization and size; 3) proper selection, use and maintenance of personal protective equipment; and 4) basic safety procedures. To ensure each field team is properly staffed to complete the task objective, while also providing for its own safety, DNREC has assigned specific employees to enforce the health and safety program. These employees, along with their major responsibilities, are listed below:

DNREC EMPLOYEE	RESPONSIBILITY
Stephanie Gordon	Project Team Leader
Karissa Hendershot	Health and Safety Officer

1.2 Project Team Leader Responsibilities

The Project Team Leader is responsible for, and has authority over, all work performed by DNREC personnel assigned to the project. The Project Team Leader establishes project policies and procedures, monitors cost and performance, and resolves conflicts and problems in the HASP, principally through the Site Health and Safety Officer.

The Project Team Leader, with the assistance of the Site Health and Safety Officer, is responsible for the job-related health and safety of on-site personnel, and for managing the risks associated with equipment and facilities under his/her control. The responsibilities of the Project Team Leader include the following:

- Furnish complete and approved project work plans to the Site Health and Safety Officer that define the work tasks and objectives and identify the procedures/methods to accomplish those tasks and objectives;
- Provide for obtaining safe and functional facilities, equipment, and vehicles under his/her control during the project;
- Coordinate the attendance of each field team member in a health and safety meeting prior to performing site work;
- Take or cause to be taken, prudent measures to reduce hazards and to correct unsafe conditions or actions when made aware of such unsafe or potentially unsafe conditions; and
- Participate in the completion of investigation and corrective action reports.

1.3 Health and Safety Officer Responsibilities

The Health and Safety Officer has the primary enforcement authority on project sites for the policies and provisions of the site-specific HASP. The responsibilities of the Health and Safety Officer include the following:

- Ensure that all DNREC personnel comply with the HASP;
- Serve as the initial contact for all site-specific health and safety activities;
- Prepare a site-specific HASP with assistance from the Project Team Leader;
- Assist the Project Team Leader in documenting compliance with the Health and Safety Program and site-specific HASP;
- Obtain documentation from all DNREC site personnel that they have received the proper training and medical certification as per 29 CFR 1910.120;

- Document and conduct briefing sessions for on-site personnel concerning site-specific hazards, emergency procedures, and symptoms associated with exposure;
- Determine the required level of personal protective equipment based on guidance given in the site-specific HASP and based on actual on-site operations;
- Seek guidance from the Project Team Leader when unanticipated conditions develop and obtain and approved site-specific HASP amendment before continuing;
- Ensure proper operation, calibration, and storage of monitoring equipment;
- Enforce the "buddy system" as defined in 29 CFR 1910.120;
- Set up, enforce, and document decontamination procedures;
- Inspect and maintain the first aid kit and other emergency equipment;
- Act as Emergency Coordinator with the assistance of the Project Team Leader;
- Assume DNREC's lead role during medical emergencies;
- Monitor personnel for heat/cold stress; and
- Prepare accident reports with assistance from the Project Team Leader.

2.0 SITE DESCRIPTION

See appropriate Section of Site Work Plan.

3.0 FIELD ACTIVITIES

DNREC personnel will be overseeing the construction of boreholes with a direct push Geoprobe®-type drilling rig across the Site for the purpose of sampling soils and installing and sampling monitoring wells. Refer to the site Work Plan and/or Standard Operating Procedures for a detailed description of the tasks to be performed.

If at any time during this activity, DNREC personnel observe any unanticipated hazards which are not adequately addressed in this HASP they will, if safely possible, attempt to control the situation, and/or immediately leave the Site.

Under No Circumstances will Confined Space Entry be permitted during Field Activities.

4.0 SAFETY AND HEALTH HAZARD ANALYSIS

The primary hazards which may be present during the sampling of the monitor wells include: potential exposure to chemical contaminants; noise; trips and falls; heavy equipment concerns; and precipitation and temperature dependent injuries.

4.1 Chemical Hazards

Site chemical hazards may include metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), pesticides, polychlorinated biphenyls (PCBs), dioxins, and poly- and perfluoroalkyl substances (PFASs).

4.2 Operational Hazards and Protective Measures

A variety of potential physical hazards may be encountered on-site. These include the following: 1) injury resulting from contact with equipment; 2) tripping and falling; and 3) precipitation and hot/cold temperatures.

4.2.1 Slips/Trips/Falls

The Site may present a potential for trip and fall hazards. DNREC personnel should pay particular attention to uneven terrain, ditches, debris, partially buried drums, and any other Site characteristics that may present trip and fall hazards.

4.2.2 Precipitation

Precipitation may cause slippery conditions, impair vision, create hidden hazards, and increase the risk of electrical shock. Individuals working during these conditions may encounter the following:

- Vehicle operation may be hampered by window fogging/frosting or slippery driving conditions.
- These conditions will increase the chance of slipping when walking, climbing steps and ladders, and working at elevation.
- Use of electric equipment in these conditions will increase the risk of electrical shock.
- Fog may hamper vehicle operation or visual communication among workers.
- These conditions may cause slippage on braking devises on augers, drills, etc.

To ensure safe working conditions during rainy weather the Site Health and Safety Officer should be aware of changing weather conditions and instruct workers to stop work or proceed cautiously when these conditions are encountered.

4.2.3 Air Monitoring

General hazards frequently encountered during air sampling and monitoring include:

- Placing sampling pumps in elevated areas or areas where slip/trip and fall hazards exist.
- Hazards associated with ambient environment being sampled. Readings indicating non-explosive atmospheres, low concentrations of toxic substances, or other conditions may increase or decrease suddenly, changing the associated risks.
- Electrical hazards as a result of power sources to run sampling pumps.

These hazards can be prevented with the following measures:

- Grounded plugs should be used when a power source is needed to reduce the hazard of electric shock.
- Personnel should be thoroughly familiar with the use, limitations and operating characteristics of the monitoring instruments.
- Perform continuous monitoring in variable atmospheres.
- Use intrinsically safe instruments until the absence of combustible gases or vapors is anticipated.

4.2.4 Groundwater Sampling

Hazards generally encountered during groundwater sampling include the following:

- Exposure to vapors of volatile organics when the well is initially opened.
- Back strain due to lifting bailers or pumps from down-well depths and moving equipment (generators) to well locations.
- Slipping on wet, muddy surfaces created by spilled water.
- Electrical hazards associated with use of electrical equipment around water or wet surfaces.
- Possible water splashing in eyes during sampling.
- The hazards involved with groundwater sampling can be prevented using the following measures:
    - To minimize exposure to volatiles when the well head is initially opened, a monitoring instrument (HNU, OVA) should be placed near the opening to monitor organic levels.

The breathing zone should also be monitored. The action levels on the instruments should be chosen before site work begins, and should be outlined in the safety plan. To prevent contact with contaminated groundwater, or product material, provide adequate protective equipment.

- Back strain can be prevented by employing proper lifting and bailing techniques. Heavy equipment, such as pumps and generators, should only be lifted with the legs, preferably using two or three personnel.

- Slipping on wet surfaces can be prevented by placing all purged water in drums for removal. Also, if the area is wet wear boots with good treads and be alert of where personnel are walking to decrease the chance of slipping.

- Ground fault interrupter should be used in the absence of properly grounded circuitry or when pumps are used around wet conditions.

- Electrical extension cords should be protected or guarded from damage (i.e., cuts from other machinery) and be maintained in good condition.

- Eye protection should be worn as appropriate to prevent splashing into eyes.

4.2.5 Site Survey

General hazards associated with site walk-throughs, site surveys, and sampling grid layout include the following:

- Exposure to irritant and toxic plants such as poison ivy and sticker bushes may cause allergic reactions to personnel.

- Surfaces covered with heavy vegetation and under growth create a tripping hazard.

- Back strain due to carrying instruments.

- Native wildlife such as rodents, ticks, and snakes present the possibility of insect bites and associated diseases such as Lyme disease.

- Driving vehicles on uneven or unsafe surfaces can result in accidents such as overturned vehicles or flat tires.

- Electrical hazard due to fallen lines.

- Heat stress/cold stress exposure.

- On-site chemical hazards depending on contaminant location and contact or disturbances of contaminated areas.

HAZARD PREVENTION

- Wear long sleeved clothing and slacks to minimize contact with irritant and toxic plants and to protect against insect bites. Appropriate first aid for personnel with known allergic reactions.

- Be alert and observe terrain while walking to minimize slips and falls. Steel-toed boots provide additional support and stability.

- Use proper lifting techniques to prevent back strain.

- Avoid wildlife when possible. In case of an animal bite, perform first aid and capture the animal, if possible, for rabies testing. Perform a tick check after leaving a wooded or vegetated area.

- Ensure all maintenance is performed on vehicles before going to the field. A site surveillance on foot might be required to choose clear driving paths.

- Ensure fallen power lines are not energized.

- Avoid buildings which are not structurally sound.

- Implement heat stress management techniques such as shifting work hours, electrolyte fluid intake, and monitoring employees, especially high risk workers.

4.2.6 Perimeter Monitoring (if needed)

These site boundaries clearly mark off the "clean" off-site areas, from the "contaminated" on-site areas, and so chemical contamination from the site should not be a hazard associated with perimeter and off-site monitoring.

Perimeter monitoring and off-site monitoring are performed once the site boundaries have been established. Hazards specific to perimeter and off-site monitoring include encounters with residents and non-project personnel. This is a unique hazard, in that untrained personnel prove to be a risk when performing any type of site work. Inquisitive and/or hostile persons may interfere with the monitoring/sampling effort, jeopardizing the safety of themselves as well as the safety of the field team.

HAZARD PREVENTION

To minimize public involvement in perimeter monitoring/off-site monitoring, the most effective preventative measure is to inform all interested parties. Notifying state and local police, the fire department, and any local/state governmental officials of the projects purpose and scope will allow those authorities to answer questions posed to them by local residents and the media by preparing statements

on the projects purpose or by informing the public where to call for further information. This will alleviate the problem of work stoppage due to field personnel answering questions.

4.2.7 Surface Soil Sampling

For the purposes of this hazard identification section, surface soil sampling will be considered any soil sampling completed by hand using a trowel, split spoon, shovel, auger, or other type of handheld tool. Hazards generally associated with soil and tailings/soils sampling include:

- Contact with or inhalation of contaminants, potentially in high concentrations in sampling media.
- Back strain and muscle fatigue due to lifting, shoveling and augering techniques.
- Contact with or inhalation of decontamination solutions.

HAZARD PREVENTION

To minimize exposure to chemical contaminants, a thorough review of suspected contaminants should be completed and implementation of an adequate protection program.

Proper lifting (pre-lift weight assessment, use of legs, multiple personnel) techniques will prevent back strain. Use slow easy motions when shoveling, auguring, and digging to decrease muscle strain.

Material Safety Data Sheets for all field solutions should be included with each Site Health and Safety Plan.

First aid equipment should be available based on MSDS requirements.

4.2.8 Subsurface Soil Sampling

For the purposes of this hazard identification section, subsurface soil sampling will be considered any soil sampling completed by hand using a trowel, split spoon, shovel, auger, or other type of handheld tool. Hazards generally associated with soil and tailings/spoils sampling include:

- Contact with or inhalation of contaminants, potentially in high concentrations in sampling media.
- Back strain and muscle fatigue due to lifting, shoveling and augering techniques.
- Contact with or inhalation of decontamination solutions.

HAZARD PREVENTION

To minimize exposure to chemical contaminants, a thorough review of suspected contaminants should be completed and implementation of an adequate protection program.

Proper lifting (pre-lift weight assessment, use of legs, multiple personnel) techniques will prevent back strain. Use slow easy motions when shoveling, augering, and digging to decrease muscle strain.

Material Safety Data Sheets for all decon solutions should be included with each Site Health and Safety Plan.

First aid equipment should be available based on MSDS requirements.

4.2.9 Groundwater Well Installation

Hazards generally associated with drilling operations include the following:

- Noise levels exceeding the OSHA PEL of 90 dBA are both a hazard and a hinderance to communication.
- Fumes (carbon monoxide) from the drill rig.
- Overhead utility wires, i.e., electrical and telephone, can be hazardous when the drill rig boom is in the upright position.
- Underground pipelines and utility lines can be ruptured or damaged during active drilling operations.
- Moving parts, i.e. augers, on the drill rig may catch clothing. Free or falling parts from the cat head may cause injury.
- Moving the drill rig over uneven terrain may cause the vehicle to roll over or get stuck in a rut or mud. Be aware of hazards associated with moving heavy machinery and other associated injury.
- High pressure hydraulic lines and air lines used on drill rigs are hazardous when they are in ill repair or incorrectly assembled.

HAZARD PREVENTION

Review the contaminants suspected to be onsite and perform air monitoring as required. Shut down drill rig and/or divert exhaust fumes.

All chains, lines, cables should be inspected daily for weak spots, frays, etc.

Ear muffs and ear plugs effectively reduce noise levels.

Hard hats should be worn at all times when working around a drill rig. Secure loose clothing. Check boom prior to approaching drill rig.

To avoid contact with any overhead lines, the drill rig boom should be lowered prior to moving the rig. Overhead utilities should be considered "live" until determined otherwise.

The rig mast should not be erected within 10 feet of an overhead electrical line until the line is de-energized, grounded, or shielded and an electrician has certified that arcing cannot occur.

Minimum working distances around "live" overhead power lines are:

Minimum working voltage range [(phase to phase) kilovolt]	clear hot stick distance
2.1 to 15	2ft. 0 in.
15.1 to 35	2ft. 4 in.
35.1 to 46	2 ft. 6 in.
46.1 to 72.5	3 ft. 0 in.
72.6 to 121	3 ft. 0 in.
138 to 145	3 ft. 6 in.
161 to 169	3 ft. 8 in.
230 to 242	5 ft. 0 in.
345 to 362	7 ft. 0 in.
500 to 552	11 ft. 0 in.
700 to 765	15 ft. 0 in.

A thorough underground utilities search should be conducted before the commencement of a drilling project.

All high pressure lines should be checked prior to and during use.

4.2.10 Surface Water, Lagoon and Sediment Sampling

Hazards generally encountered during sampling include the following:

Drowning due to slipping, tripping, or falling. Drowning can occur as a result of falling into the lagoon while sampling, or by falling out of a boat. The use of personal protective clothing will increase the chance of drowning and accidents, due to the added weight and cumbersome nature of PPE.

Contact with contaminated water and possibly splashing water into eyes during sampling procedures.

HAZARD PREVENTION

Sampling should be done on the lagoon bank, and the sampler should be secured with a safety line. The sampler should wear chemical resistant hip waders, and should not stand in lagoon water.

If a boat must be used, a row boat in good condition and complete with floating oars should be employed. (NOTE: Some metals found in boats may be reactive with contaminants in the water, such as aluminum). Two samplers should be in the boat, seated on opposite ends, and each should wear a life preserver. Samplers should remain seated while in the boat, and if feasible, the boat should be connected to the shore by a rope. A safety watch should be posted on shore.

The buddy system should be used at all times.

5.0 PERSONAL PROTECTIVE EQUIPMENT

The level of personal protective equipment required for this activity is a modification of Level D, as outlined in the DNREC Division of Waste and Hazardous Substances Health and Safety Manual (revised March 2016), and includes: protective clothing, steel-toed footwear, hard hats, gloves, and over boots. Each person on-site will possess an air purifying respirator if the protection level is needed to be upgraded to include air purifying respiratory protection.

Each sampling team will have a cellular phone to be able to contact, or be contacted, by the remaining sampling crews and/or the DNREC office.

6.0 HAZARD MONITORING

DNREC will conduct air monitoring using a direct reading Photoionization Detector (PID) instrument equipped with a 10.2 eV lamp source or a dual PID/FID vapor analyzer. Prior to entering the Site, DNREC personnel will ensure that the direct reading instrument has been properly calibrated according to the manufacturer's instructions.

After proper calibration, DNREC personnel will determine the wind direction at the Site and take an organic vapor concentration reading from upwind of the Site. Combustible Gas readings will also be taken. These readings will be recorded in the field logbook as the background reading. While sampling of the monitor wells is occurring, DNREC personnel will continue to measure organic vapors and combustible gas concentrations. Recording of monitoring the organic vapor concentrations will be done on a half-hourly basis, or more frequently based upon the readings registered on the PID of CGI. PID readings will be taken at the opening of the well and in the breathing zone, or at the discretion of the DNREC Health and Safety Officer. If PID readings of greater than five (5) ppm over the background level are encountered, PID monitoring will be continuous, and readings will be recorded at least every fifteen minutes. All instrument readings will be recorded in the field logbook for future documentation.

If at any time, the instrument meter sustains a reading, for fifteen minutes or more, of five (5) ppm or more above the background measurement, DNREC personnel will immediately don respirators (if available) or leave the vicinity. If PID readings exceed 500 ppm all personnel will leave the vicinity until readings reduce. If a reduction in readings is not achieved, the boring will be backfilled and abandoned, unless under supplied air. If at any time, the CGI indicates a level of 5% LEL work will stop until dissipation of the gas.

CONDITIONS WARRANTING EVACUATIONS OF DNREC PERSONNEL FROM SITE

PID/FID readings elevated to 500 ppm or more above background readings for fifteen minutes.
Observation of symptoms of chemical contaminant exposure.
Visible dust emissions on-site.
LEL of 10% or greater.
Oxygen less than 19% (if not on supplied air).

7.0 DECONTAMINATION

DNREC personnel will follow a standard decontamination procedure based on the assessed exposures to contaminants at the site. If contaminated, personnel must decontaminate boots and wash hands and face prior to leaving the Site. Personnel will dispose of any disposable personal protective equipment as necessary in a plastic garbage bag. All garbage bags will be disposed of in an appropriate manner.

To help reduce potential for spread of contaminants, all personnel shall avoid walking through standing or running water or leachate seeps. In addition, personnel shall take all precautions to avoid contact with any potentially contaminated materials, unless wearing appropriate PPE. All decon water will be returned to the ground surface upon completion of the activities.

7.1 Work Limitations

During all field activities, DNREC personnel will adhere to the following:

- A complete first aid kit will be easily accessible;
- Work will be restricted to daylight hours only;
- A buddy system will be employed at all times on-Site;
- Outdoor work will stop during storms or electrical storms;
- Minimize contact with excavated, purged, and contaminated materials;
- Maintaining safety equipment; and
- Maintaining an emergency contact and telephone number list and area maps or directions to the nearest medical facility.

Personnel from the DNREC will be performing air quality monitoring in the immediate area of the field operation with a PID.

7.2 Site Control Measures

No unauthorized personnel will be allowed on site within 60 feet of the sampling operation. The Project Team Leader will be in charge of controlling access into and out of the site in the immediate area of the monitor well sampling operation. The location of the decontamination and support zone will be determined in the field.

All equipment will be decontaminated by either wiping down with soap and water or washing with soap and water. All equipment, after decontamination, will need to be rinse wiped or rinsed.

All disposable equipment will be doffed and put in two 6 mil. drum liner bags and sealed with duct tape.

8.0 EMERGENCY RECOGNITION AND PREVENTION

In case of an immediate hazard to employees or the public, all employees on the Site will take all practicable steps to eliminate or neutralize the hazard; this may include leaving the Site. Follow-up consultation with the Project Team Leader and the Site Health and Safety Officer must then be made at the first opportunity. In such circumstances, the Project Team Leader will take, or cause to be taken, the necessary steps to ensure that the drilling of monitor wells can be completed safely. Such steps may include changes in procedure, removal or neutralization of a hazard, consultation with appropriate experts or specialists; and modifications to this HASP. In cases where the hazard is not immediate, the employee will consult the Project Team Leader of the Site Health and Safety Officer regarding appropriate corrective measures.

Prevention of accidents requires exercising good judgment and common sense by all employees.

In the event that any member of the field team is overcome, incapacitated, or traumatically injured while on-Site, the remaining members will immediately call for assistance and then don appropriate protective equipment and make a reasonable effort to rescue the affected person.

At least one person should remain out of the problem area until help arrives. Once removed from the problem area, the affected person will not be left unattended. If possible, limited personal decontamination should be conducted, but not if time is critical to get the injured person to medical aid. If it is determined that the problem was due to chemical exposure, all field team members will proceed expeditiously, in a group to the nearest medical facility. In those cases where personal contamination has occurred, all persons involved shall make every reasonable effort to decontaminate themselves, so there will be minimal spreading of contaminants.

Non-Verbal Communications

The following standardized non-verbal communications signals will be used when necessary on-site:

Thumbs-up = "OK/Affirmative, I am alright, I understand"

Thumbs-down = "No, Negative"

Hands on top of head = "Need Assistance"

Gripping partners wrist or gripping both hands or wrists = "Leave Site Immediately"

These signals are to be reviewed by the Site Health and Safety Officer and all personnel covered under this plan immediately prior to site entry.

9.0 ACTION LEVELS

These action levels have been established in consideration of the entire list of Potential Contaminants of Concern for the site and as such are adequately protective of personal health and safety at any given location on site. Dependent upon the specific areas proposed for field work on any given site visit, the

specific activities to be performed, and the documented contaminants for that location, the Project Team Leader or Site Health and Safety Officer may alter these action levels to more accurately reflect specific chemical hazards presented by that specific area or areas.

ACTION LEVELS

INSTRUMENT	READING	ACTION
PID or FID (for organic vapors)	Background to <1 ppm above background	Continue activities (Level D)
	> or = 1 ppm to <5 above background (sustained for 15 minutes or more)	Continue activities (Level D) Consult Health & Safety Officer
	> or =5 ppm above background (sustained for 15 minutes or more) (exceeds STEL for benzene)	Evacuate Area Immediately Notify Health & Safety Officer
N/A	Visible dust emissions	- evacuate area immediately - immediately notify SHSO

9.1 Emergency Notification

In the event of an on-Site emergency requiring notification to personnel off-Site, the Emergency Coordinator is responsible for immediately notifying the appropriate contacts in this section. The Emergency Coordinator will notify the Project Team Leader as soon as practicable after any emergency. The Emergency Coordinator will provide a report to the Project Team Leader and Site Health and Safety Officer describing the following:

- The event including date and time, that necessitated the notification and the basis for that decision;
- Date, time, and names of all persons/agencies notified and their response; and
- Resolution of the incident, including duration and corrective action involved.

9.2 Sanitary Facilities

Location of the nearest Sanitary facility: Nearby gas stations and fast food restaurants.

10.0 EMERGENCY CONTACTS AND TELEPHONE NUMBERS

The following numbers are listed for use in an emergency.

DIAL 911 TO CONTACT AMBULANCE, FIRE, OR POLICE OFFICIALS

Location of nearest telephone: Any personal or DNREC-SIRS cell phone that personnel is carrying

Christiana Hospital, Newark (302) 733-1000	5.3 miles
St. Francis Hospital, Wilmington (302) 421-4333	7.8 miles
Directions attached.	

(To be filled in by the Site Health and Safety Officer)

EMERGENCY 911 SERVICE X Established __ Not Established

AMBULANCE.....	911
FIRE DEPARTMENT.....	911
POLICE DEPARTMENT.....	911
STATE POLICE.....	911
POISON CONTROL CENTER	1-800-222-1222
NATIONAL RESPONSE CENTER	1-800-424-8802
DNREC EMERGENCY RESPONSE	1-800-662-8802

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Tim Ratsep, Environmental Program Administrator.....w) 302 395.2600
..... c) 302.383.5759
Qazi Salahuddin, Program Manager II.....w) 302.395.2600

11.0 SIGNATURES

All site personnel have read the above plan and are familiar with its provisions.

Title	Printed Name	Signature
Site Safety Officer	Karissa Hendershot	
Project Team Leader	Stephanie Gordon	

Team Personnel

Rick Galloway

Site Safety Officer signs last and dates it
Karissa Hendershot

Google Maps 151 N Dupont Hwy, New Castle, DE 19720 to Saint Francis Hospital Drive 7.8 miles, 17 min

Map data ©2017 Google 1 mi

151 N Dupont Hwy
New Castle, DE 19720

1. Head southwest

1 min (0.1 mi)

Take DE-141 N and I-95 N to S Adams St in Wilmington. Take exit 6 from I-95 N

10 min (6.6 mi)

2. Turn left onto US-13 N/US-40 E

0.7 mi

3. Turn right onto the DE-141 N/US-202 N ramp to Newport

0.2 mi

4. Merge onto DE-141 N

1.7 mi

5. Use the left lane to merge onto I-95 N via the ramp to I-495 N/Wilmington/Philadelphia

1.3 mi

6. Keep left to stay on I-95 N

2.4 mi

7. Take exit 6 for DE-4/Maryland Ave toward M.L King Jr Blvd

0.3 mi

Take W 2nd St to N Clayton St

6 min (1.1 mi)

8. Continue onto S Adams St (signs for Frawley Stadium Alt Ent)

0.2 mi

9. Turn left onto W 2nd St

0.5 mi

10. Turn right onto N Clayton St

Destination will be on the left

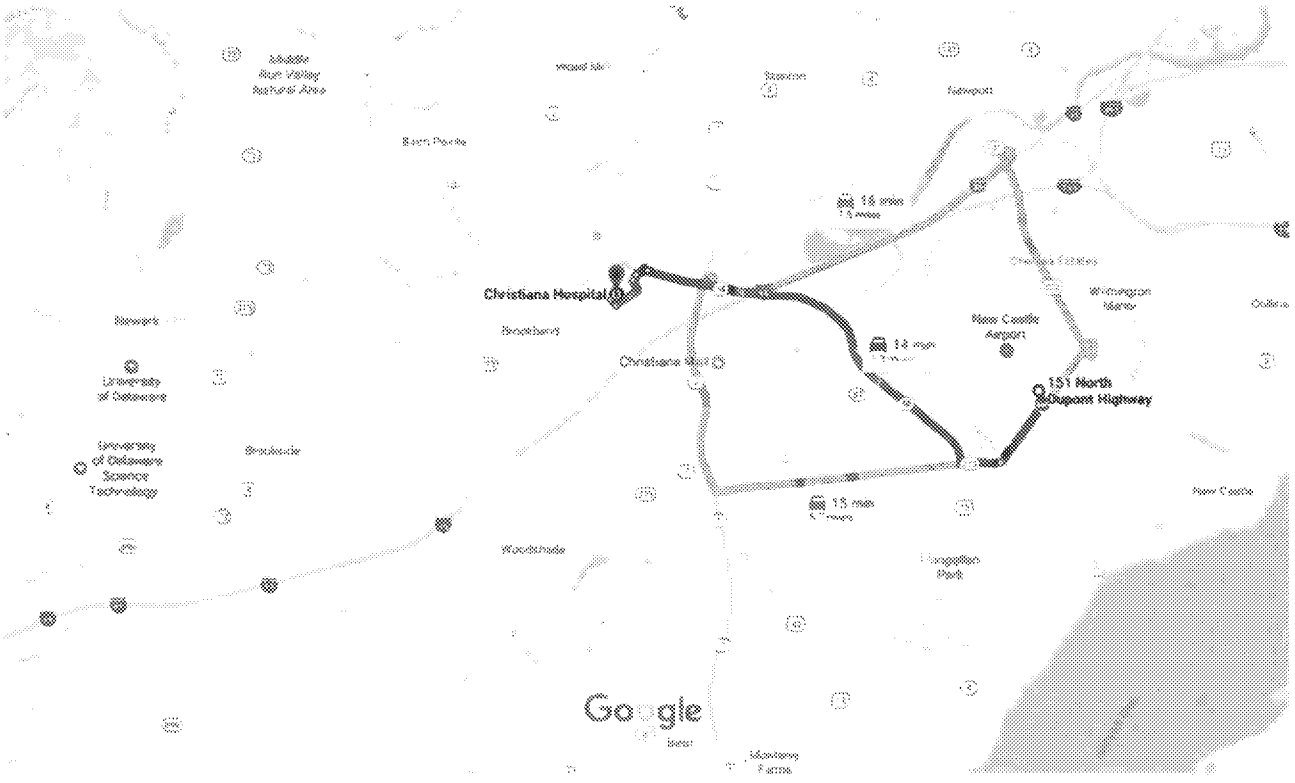
0.3 mi

Saint Francis Hospital

701 N Clayton St, Wilmington, DE 19805

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Google Maps **151 N Dupont Hwy, New Castle, DE 19720 to Christiana Hospital** Drive 5.3 miles, 14 min



Map data ©2017 Google 1 mi

151 N Dupont Hwy

New Castle, DE 19720

1. Head southwest

1 min (0.1 mi)

Drive along DE-58 W

9 min (4.5 mi)

2. Turn right onto US-13 S/US-40 W/N Dupont Pkwy

0.6 mi

3. Turn right onto DE-273 W/Christiana Rd/Frenchtown Rd W

0.3 mi

4. Turn right onto DE-58 W

3.6 mi

Drive to your destination

4 min (0.6 mi)

5. Use the left lane to turn left

0.1 mi

6. Turn left

351 ft

7. Turn left

0.3 mi

8. Turn right

377 ft

9. Turn right

226 ft

Christiana Hospital

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.